

**Rina 1999 International Symposium**  
**Rome, Italy**  
**Keynote Address**  
***“The Implementation Of Pertinent Instruments”***  
**September 23, 1999**

GOOD MORNING LADIES AND GENTLEMEN IT IS A PLEASURE  
FOR ME TO BE AT THIS SYMPOSIUM IN THE “ETERNAL  
CITY” OF ROME AND AN HONOR TO SPEAK TO YOU.

FIRST I WOULD LIKE TO EXPRESS MY THANKS TO RINA AND MY  
GOOD FRIEND AND IMO COLLEAGUE DR. GIULIANO  
PATTOFATTO FOR PROVIDING ME THE OPPORTUNITY TO  
TALK ABOUT BRIDGING THE GAP BETWEEN TECHNOLOGY  
AND OPERATIONS. I APPRECIATE THE VERY PRODUCTIVE  
RELATIONSHIP THAT EXISTS BETWEEN RINA AND THE U.S.  
COAST GUARD AND LOOK FORWARD TO ITS CONTINUED  
DEVELOPMENT.

MY FUNCTION TODAY AS ONE OF THE KEYNOTE SPEAKERS IS TO START THE THOUGHT PROCESS, TO HELP SET THE STAGE, FOR DISCUSSIONS THAT WILL TAKE PLACE AT THE TECHNOLOGY AND OPERATION PANELS. I WILL DO THIS FROM THE PERSPECTIVE OF A PORT AND FLAG STATE ADMINISTRATION BY EXPLORING SOME OF THE FACTORS THAT I BELIEVE ARE RELEVANT IN LINKING TECHNOLOGY AND OPERATIONS, INCLUDING PERTINENT IMO INSTRUMENTS, AND OFFERING SOME QUESTIONS TO STIMULATE THOUGHT.

OF COURSE COPING WITH TECHNOLOGY IS NOT A NEW PROBLEM, BUT THE ACCELERATING PACE OF TECHNOLOGICAL ADVANCE HAS CREATED GREATER CHALLENGES FOR US ALL.

THIS SYMPOSIUM'S PANEL TOPICS REPRESENT A CROSS SECTION OF TECHNOLOGY AND OPERATIONS ISSUES THAT ARE VERY PROMINENT TODAY. ALTHOUGH TECHNOLOGY PRESENTS OPPORTUNITIES TO IMPROVE OUR OPERATIONS, IT ALSO RAISES RISK IF NOT PROPERLY UNDERSTOOD AND APPLIED, OR IF TOO MUCH DEPENDENCE IS PLACED UPON IT. I COMPLIMENT RINA'S INITIATIVE TO BRING THE ISSUE FORWARD FOR TODAY'S DISCUSSION AND HOPE THAT WE WILL FIND AREAS OF IMPROVEMENT TO PURSUE.

THE MASTERING OF TECHNOLOGY BY MARINERS TRANSLATES THAT TECHNOLOGY INTO SAFE, EFFICIENT, AND ENVIRONMENTALLY RESPONSIBLE OPERATIONS. ACCORDINGLY, I BELIEVE THE MOST IMPORTANT LINK BETWEEN THE TWO, THE GAP FILLER IF YOU WILL, IS THE HUMAN ELEMENT AND IMO INSTRUMENTS RELATIVE TO THE HUMAN ELEMENT AND TECHNOLOGY MUST BE DEVELOPED WITH THE HUMAN ELEMENT IN MIND.

THE RECENT COLLISION BETWEEN THE VESSELS NORWEGIAN DREAM AND THE EVER DECENT IN THE ENGLISH CHANNEL RAISES THE ISSUE OF THE RELATIONSHIP BETWEEN TECHNOLOGY, OPERATIONS, AND THE HUMAN ELEMENT AGAIN.

PERHAPS THE EDITORIAL IN THE AUGUST 26 EDITION OF LLOYD'S LIST SAYS IT BEST WHEN IT SPEAKS ABOUT THE UK'S MEDIA INTEREST, SAYING, AND I QUOTE: "THEY ALL WANTED TO KNOW HOW TWO MODERN VESSELS – THE CRUISE SHIP NORWEGIAN DREAM AND THE CONTAINERSHIP EVER DECENT – EQUIPPED WITH ALL THE LATEST TECHNOLOGY AND SAILED BY WELL TRAINED CREWS COULD CRASH INTO EACH OTHER? HAD THE VESSELS BEEN SHROUDED IN FOG, OR HAMPERED BY HIGH SEAS, THE ACCIDENT MIGHT HAVE BEEN MORE UNDERSTANDABLE – THOUGH NONE THE LESS INEXCUSABLE. BUT THE FACT THAT THE VISIBILITY WAS

GOOD AND THE WEATHER FAIR HAS ADDED TO THE PUZZLEMENT. THE TWO COMPANIES INVOLVED, NORWEGIAN CRUISE LINES AND EVERGREEN MARINE, HAVE GOOD SAFETY RECORDS AND ARE AMONG THE LARGEST MARITIME ENTERPRISES IN THE WORLD, OPERATING IN THE INDUSTRY'S MOST PRESTIGIOUS SECTORS, AND BOTH ARE PUBLICLY QUOTED FIRMS. SO THE PREDICTABLE, AND SOME MIGHT SAY UNHELPFUL COMMENTS FROM SOME QUARTERS THAT HAVE SOUGHT TO LINK THE INCIDENT WITH PROBLEMS ASSOCIATED WITH LOW COST, SUBSTANDARD SHIPPING DO NOT CARRY MUCH WEIGHT.” END QUOTE.

DO WE HAVE A TECHNOLOGY INDUCED COLLISION HERE? OR HUMAN FACTORS? OR A COMBINATION OF BOTH? WHATEVER THE CAUSE THE INVESTIGATIONS SHOULD PROVE MOST INTERSTING. I WOULD ADD ANOTHER QUESTION: IF THIS HAPPENS TO VERY COMPETENT OPERATORS – WHAT DOES IT TELL US ABOUT THE RISK TO SAFETY AND THE ENVIRONMENT THAT SUB-STANDARD OPERATORS POSE?

PEOPLE CAN MAKE UP FOR THE FAILURE OF TECHNOLOGY BUT TECHNOLOGY CANNOT MAKE UP FOR HUMAN ERROR. TO QUOTE ADMIRAL THIMIO MITROPOULOUS, DIRECTOR OF THE MARITIME SAFETY DIVISION AT IMO, A PREVIOUS KEYNOTE SPEAKER TO THIS DISTINGUISHED FORUM: “PEOPLE ARE NOT ONLY PART OF THE CAUSE OF MOST ACCIDENTS BUT THEY ARE ALSO THE BEST MEANS OF PREVENTION.”

WHAT DOES THE FUTURE HOLD FOR US? THINK ABOUT SOME TRENDS. WE EXPECT WORLD MARITIME TRADE TO INCREASE TWO TO THREE TIMES OVER THE NEXT TWENTY TO THIRTY YEARS; TECHNOLOGY CONTINUES TO ACCELERATE WHILE WAITING FOR NO ONE; CARGO SHIPS ARE GROWING IN BOTH SIZE AND SPEED AS IN-PORT TIME DECREASES; PASSENGER CRUISE VESSELS ARE OF INCREASING CAPACITY; THE USE OF HIGH SPEED CRAFT IS GROWING; THERE IS A MUCH LOWER TOLERANCE BY THE PUBLIC FOR EITHER LOSS OF LIFE OR ENVIRONMENTAL DEGRADATION OF ANY SORT; AND MARITIME ISSUES SUCH AS PIRACY AND TERRORISM LOOM LARGER EVERY DAY.

GIVEN THOSE TRENDS, LET'S CONSIDER THE HUMAN ELEMENT FROM A NUMBER OF DIFFERENT ASPECTS.

1. THE RECRUITMENT OF MARINERS INTO THE INDUSTRY FOR CARRERS AT SEA;
2. THE TRAINING AND QULAIFICATION OF THOSE MARINERS, INCLUDING THE PROPER USE OF TECHNOLOGY;
3. ADEQUATE LEVELS OF MANNING GIVEN THE LEVEL OF TECHNOLOGY EMPLOYED AND THE ABILITY TO USE IT;
4. SHIP MANAGEMENT THAT RECOGNIZES GAPS BETWEEN TECHNOLOGY AND OPERATIONS;
5. AND, INTERNATIONAL STANDARDS AND REGIMES TO ADDRESS THE ABOVE AS WELL AS OTHER STRATEGIES.

FIRST RECRUITMENT. AS I TRAVEL THROUGHOUT THE UNITED STATES AND PLACE AROUND THE WORLD, I CONSISTENTLY HEAR THAT RECRUITMENT OF MARINERS FOR A CAREER AT SEA IS DIFFICULT. THERE SEEMS TO BE A CONTINUING LACK OF QUALIFIED SEAFARERS OF EVERY TYPE IN EVERY SECTOR OF THE INDUSTRY.

GIVEN THE TRENDS I MENTIONED, HOW DO WE COLLECTIVELY APPROACH RECRUITING IN A METHODICAL AND COORDINATED WAY TO MOTIVATE YOUNG MEN AND WOMEN TO GO TO SEA? IS THIS OUR MOST BASIC AND FUNDAMENTAL PROBLEM?

NEXT, THE TRAINING AND QUALIFICATIONS OF TODAY'S  
MARINERS ARE CERTAINLY AN EQUIVALENT CHALLENGE.

STCW WITH THE '95 AMENDMENTS HAS PROVIDED A  
FRAMEWORK TO DEFINE THE CURRENT REQUIREMENTS  
OF TRAINING AND QUALIFICATIONS. GAP CLOSURE  
BETWEEN TECHNOLOGY AND OPERATIONS IS ACHIEVED  
BY THE REQUIREMENTS FOR MARINERS TO PROVE THEIR  
ABILITY IN VARIOUS COMPETENCIES THROUGH A  
COMBINATION OF TRAINING AND EXPERIENCE. CLEARLY,  
AS TECHNOLOGY ADVANCES AND TIME PASSES, FUTURE  
TRENDS WILL REQUIRE US TO MODIFY THE CURRENT  
REQUIREMENTS OF STCW – WE APPEAR TO HAVE A GOOD  
START. IT WILL BE INTERESTING TO FOLLOW THE  
ACTIVITY AS IMO WORKS THROUGH THE FIRST ROUND OF  
ASSESSMENT OF FULL AND COMPLETE IMPLEMENTATION  
OF STCW BY FLAG ADMINISTRATIONS.

THE STCW 95 AMENDMENTS ARE SCHEDULED TO BE FULLY  
IMPLEMENTED BY THE FIRST OF FEBRUARY 2002. WILL  
THEY BE ADEQUATE TO DEAL WITH THE RATE OF  
ADVANCE OF TECHNOLOGY AS APPLIED TO MARITIME  
OPERATIONS? FOR HOW LONG?

NEXT, MANNING LEVELS OVER THE YEARS HAVE BEEN CONTINUOUSLY REDUCED AS TECHNOLOGY HAS ADVANCED AND BEEN USED TO REPLACE SEAFARERS. ARE WE NOW AT CRITICAL MASS IN TERMS OF CREW SIZE? WHEN CREWS WERE CONSIDERABLY LARGER AND A SHIP SUFFERED A MAJOR CASUALTY, THERE WERE USUALLY A SUFFICIENT NUMBER OF PERSONNEL TO WORK AT SAVING THE VESSEL AND ITS CARGO. TODAY IT SEEMS THAT THERE ARE HARDLY ENOUGH PERSONNEL ABOARD TO ABANDON THE VESSEL SAFELY, LET ALONE TO TRY TO MINIMIZE THE CONSEQUENCES OF A MAJOR ACCIDENT.

ARE MANNING LEVELS ADEQUATE TO SAFELY OPERATE – TO MAKE THE BEST USE OF TECHNOLOGY? DOES TECHNOLOGY ADEQUATELY COMPENSATE FOR TODAY’S MANNING LEVELS?

CONSIDER THE RECENT CONTROVERSIAL ISSUE OF SOLE LOOKOUT AT NIGHT.

FOR SOME YEARS, A NUMBER OF FLAG STATES ENGAGED IN SOLE LOOKOUT TRIALS, MEANING ONE PERSON – THE DECK WATCH OFFICER – ON THE BRIDGE AT NIGHT. THE TRIALS WERE SANCTIONED BY IMO UNDER STCW. LOOKING TOWARD POTENTIAL AMENDMENT OF THE CONVENTION TO ALLOW WIDE USE OF THE PRACTICE DEPENDING ON THE OUTCOME.



THE MISSING RATING WAS COMPENSATED FOR BY TECHNOLOGY – ERGONOMIC DESIGN, ELECTRONIC AUTO-RADAR POSITION PLOTTERS, DEAD MAN ALARMS, A GLASS ENCLOSED TOILET – ETC. THINGS DESIGNED TO ALLOW THE DECK WATCH OFFICER TO EFFICIENTLY EXECUTE HIS DUTIES WHILE STILL MAINTAINING SITUATIONAL AWARENESS WITHOUT THE HELP OF A RATING.

THE RESULTS WERE REPORTED OUT, AND A SESSION OF THE IMO MSC CONSIDERED THE ISSUE.

THE OUTCOME WAS OVERWHELMING SENTIMENT IN THE FORM OF COUNTRIES SPEAKING AGAINST CONTINUING THE PRACTICE OR AMENDING THE CONVENTION AT A RATE OF 2 TO 1. ACCORDINGLY, IMO ISSUED A CIRCULAR CALLING FOR A DISCONTINUANCE OF THE PRACTICE.

IT WAS FOUND THAT ALTHOUGH MANY SAFE OPERATIONAL HOURS WERE RECORDED, THERE WERE STILL CASUALTIES TO BE ATTRIBUTED TO EITHER FAILURE OF THE TECHNOLOGY WITHOUT THE WATCH OFFICER BEING AWARE, DELBERATE COMPROMISE OF THE TECHNOLOGY – SUCH AS THE DEAD MAN ALARM – BY THE WATCH OFFICER, OR THE WATCH OFFICER SIMPLY LOSING AWARENESS.

TIME MAY ULTIMATELY CREATE TECHNOLOGY TO ALLOW RECONSIDERATION OF THE ISSUE. IN THE INTERIM, THE TECHNOLOGY DEVELOPED CLEARLY IMPROVES THE CONDUCT OF A TWO PERSON WATCH AT NIGHT. THE CLEAR VIEW OF A MAJORITY OF FLAG AND PORT STATES WITH HIGH CONCERN FOR SAFETY AND THE ENVIRONMENT WAS THAT THE HUMAN ELEMENT WAS INADEQUATE TO BRIDGE THE GAP BETWEEN CURRENT TECHNOLOGY AND OPERATIONS IN THIS SITUATION, AND THAT ALTHOUGH CASUALTIES WERE NOT EXTENSIVE, THE PROSPECT WAS TOO REAL AND UNACCEPTABLE.

PERHAPS A CONSERVATIVE, BUT NONE THE LESS, RESPONSIBLE RESOLUTION OF THE ISSUE.

NEXT, IMPLICIT IN THE EXAMPLE I JUST DISCUSSED IS A NEED FOR THE SHIPS MANAGEMENT TO RECOGNIZE WHERE GAPS OCCUR BETWEEN THEIR OPERATIONS AND THE EMPLOYMENT OF TECHNOLOGY. IF IMPLEMENTED EFFECTIVELY, THE INTERNATIONAL SAFETY MANAGEMENT CODE SHOULD BE ABLE TO HELP PREVENT TECHNOLOGY AND OPERATION GAPS FROM OCCURRING.

THE ISM CODE ADDRESSES A MULTITUDE OF ISSUES RELEVANT TO TODAY'S DISCUSSIONS. BEFORE ISM, DEFICIENCIES IN SOLAS AND MARPOL WERE SIMPLY CORRECTED AND VESSELS ALLOWED TO PROCEED ON THEIR WAY. TODAY, WHEN A DEFICIENCY IS DISCOVERED WE DIG INTO THE MANAGEMENT PROCESSES OR SYSTEMS THAT ALLOWED THAT DEFICIENCY TO OCCUR. WE WORK TO ENSURE THAT THOSE ROOT CAUSES OF THE DEFICIENCY ARE CORRECTED SO THAT MATERIAL DEFICIENCIES ARE LESS LIKELY TO OCCUR. THIS INCLUDES PROCEDURES THAT LINK TECHNOLOGY TO OPERATIONS.

FOR EXAMPLE, A QUOTE FROM THE ISM CODE PARAGRAPH 10.3:

“THE COMPANY SHOULD ESTABLISH PROCEDURES IN THE SMS TO IDENTIFY EQUIPMENT AND TECHNICAL SYSTEMS THE SUDDEN OPERATIONAL FAILURE OF WHICH MAY RESULT IN HAZARDOUS SITUATIONS. THE SMS SHOULD PROVIDE FOR SPECIFIC MEASURES AIMED AT PROMOTING THE RELIABILITY OF SUCH EQUIPMENT OR SYSTEMS. THESE MEASURES SHOULD INCLUDE THE REGULAR TESTING OF STAND-BY ARRANGEMENTS AND EQUIPMENT OR TECHNICAL SYSTEMS THAT ARE NOT IN CONTINUOUS USE.”

ISM IMPLEMENTATION SEEMS TO BE PROGRESSING MORE SMOOTHLY THAN ANTICIPATED. CONSIDERING PORT STATE CONTROL DETENTIONS IN THE U.S., THEY HAVE DRAMATICALLY DECLINED OVER THE LAST 18 MONTHS INSPITE OF THE IMPLEMENTATION OF ISM AND STCW THAT WE THOUGHT WOULD CAUSE AN INCREASE. HOW MUCH CREDIT SHOULD WE GIVE ISM PREPARATION FOR ITSELF IMPROVING QUALITY AND STIMULATING THAT DECLINE IN DETENTIONS?

I'VE ADDRESSED STCW AND ISM AS INTERNATIONAL STANDARDS RELEVANT TO LINKING TECHNOLOGY AND OPERATIONS IN THE MARITIME INDUSTRY USING THE HUMAN ELEMENT. HOW MUCH MORE WORK STILL NEEDS TO BE DONE TO BRIDGE THE GAP BETWEEN TECHNOLOGY AND OPERATIONS? WHILE THE HIGH SPEED CRAFT CODE IN SOLAS HAS FOCUSED ON DESIGN. BEYOND TYPE RATING ISSUES, WHAT ABOUT OPERATIONS – TRAFFIC MANAGEMENT? WHAT DO WE NEED THERE TO ENSURE THAT THE TECHNOLOGY CREATED IN THE FORM OF HSC CAN OPERATE SAFELY ONCE DEPLOYED?

SHOULD A SYSTEM LIKE TYPE RATING BE REQUIRED FOR OTHER CLASSES OF VESSELS, ESPECIALLY PASSENGER VESSELS NOT BUILT TO THE HSC CODE BUT OPERATING AT EQUIVALENT SPEED WITH SIMILAR TECHNOLOGY?

ONE OF THE STRATEGIES THAT WE IN THE U.S. ARE USING TO BRIDGE THE GAP BETWEEN TECHNOLOGY AND OPERATIONS IS A HUMAN ELEMENT BASED, NON-REGULATORY PARTNERSHIP, WITH THE MARITIME INDUSTRY “PREVENTION THROUGH PEOPLE” (PTP) EFFORT. THE PTP VISION STATEMENT CONTINUES TO BE: “TO ACHIEVE THE WORLD’S SAFEST, MOST COST-EFFECTIVE AND ENVIRONMENTALLY SOUND MARITIME TRANSPORTATION SYSTEM, BY EMPHASIZING THE ROLE OF PEOPLE IN PREVENTING CASUALTIES AND POLLUTION.” OUR STRATEGY INVOLVES HUMAN ERROR DETECTION, ASSESSMENT, AND PREVENTION TECHNIQUES SUCH AS ROOT CAUSE INVESTIGATION ANALYSIS. THE PRINCIPLES OF PTP ARE FIVE FOLD:

- HONOR THE MARINER. SEEK AND RESPECT THE OPINION OF THOSE WHO DO THE WORK AFLOAT AND ASHORE.
- MAINTAIN BALANCE. APPLY COST EFFECTIVE SOLUTIONS TO SAFETY AND ENVIRONMENTAL ISSUES.
- SEEK NON-REGULATORY SOLUTIONS. ENCOURAGE AND EMPHASIZE INCENTIVES AND INNOVATION. RECOGNIZE AND SUPPORT THOSE WHO SEEK TO RISE AND REMAIN ABOVE THE MINIMUM LEVELS OF REGULATORY COMPLIANCE.

- TAKE A QUALITY APPROACH. SEEK A BETTER, AND MORE COST EFFECTIVE SOLUTION. ADVOCATE THE PRINCIPLE THAT PROCESS IMPROVEMENTS AND COST SAVINGS GO HAND IN HAND WITH SAFE OPERATIONS. –AND–
- SHARE COMMITMENT. PTP IS THE RESPONSIBILITY OF BOTH THE INDUSTRY AND THE GOVERNMENT.

WE HAVE FOUND THIS APPROACH TO BE EFFECTIVE AS AN ADMINISTRATION IN WORKING COOPERATIVELY WITH INDUSTRY TOWARD OUR MUTUAL GOALS IN SAFETY AND PROTECTION OF THE ENVIRONMENT.

IN CONCLUSION, THERE CLEARLY REMAINS A CHALLENGE TO IMPLEMENT AND EMPLOY TODAY’S TECHNOLOGY IN A SAFE, EFFECTIVE, AND ENVIRONMENTALLY SOUND MANNER AND THERE ARE MANY ASPECTS TO THIS TO BE DISCUSSED TODAY. AND WHILE WE FACE THAT CHALLENGE WE MUST KEEP AN EYE ON THE COMING TECHNOLOGY OF TOMORROW AND THE NEW CHALLENGES THAT WILL NEED TO BE ADDRESSED.

IN THE SAME SPIRIT THAT MANY SAY – AND I AMONG THEM – THAT THERE ARE ENOUGH INTERNATIONAL CONVENTIONS TODAY TO MAKE SHIPPING SAFE. WE ONLY NEED TO IMPLEMENT THEM PROPERLY.

PERHAPS WE HAVE DONE MORE TO DEVELOP TECHNOLOGY  
THAN IN IMPLEMENTING IT WELL. HOWEVER, NO MATTER  
WHAT LEVEL OF TECHNOLOGY IS IMPLEMENTED I  
BELIEVE THAT PEOPLE ARE THE KEY TO IMPLEMENTING  
AND USING THE TECHNOLOGY THAT HAS BEEN  
DEVELOPED TO CREATE A QUALITY SHIPPING INDUSTRY  
FOR THE CONTINUING BENEFIT OF MANKIND.

TECHNOLOGY MUST BE CREATED WITH PEOPLE IN MIND. I  
HAVE PROVIDED SOME PERSPECTIVES ON LINKING  
TECHNOLOGY TO OPERATIONS AND CITED SOME  
EXAMPLES.

I HOPE I HAVE STIMULATED YOUR THINKING AND I LOOK  
FORWARD TO LISTENING AND PARTICIPATING IN THE  
UPCOMING PANEL DISCUSSIONS. WE HERE, AS PART OF  
THE HUMAN ELEMENT, HAVE THE OPPORTUNITY TODAY  
TO HELP BRIDGE THE GAP BETWEEN TECHNOLOGY AND  
OPERATIONS. PLEASE PARTICIPATE VIGOROUSLY.